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Federal-State Joint Effort For Florida Citrus Growers

Weather Forecasting

HORTICULTURAL PROTECTION SERVICE
EXAMPLE OF NUMEROUS ACTIVITIES

BY JEFFERSON THOMAS

Florida fruit growers, concerned because of threatened damage to crops from cold on several occasions during the present winter, have listened to many radio broadcasts giving the temperature predictions prepared by the Federal-State Horticultural Protection Service, which has headquarters at Lakeland. In the introduction to each was contained the announcement that distribution of was jointly sponsored by the United States Weather Bureau and the Florida Agricultural Experiment Station.

Frost-freeze special forecasts and warnings have been desired in the citrus and truck producing sections of the state for many years. Through the greater part of this period, the demand for the service mostly was manifested in complaints that California had been favored above Florida at the hands of Uncle Sam in that over a considerable time the data were available on the Pacific coast, season after season, but not here. Texas was similarly accommodated after a while, inquiry disclosed.

When the disastrous cold wave in December, 1934, had brought heavy losses to many sections of Florida without advance warnings that were regarded as adequate, sentiment developed for aggressive action seeking precautionary measures against repetitions of the conditions. Movements

for obtaining the special equipment and trained personnel that could remedy the situation were then organized, which went places and got things done.

Investigations revealed that the federal funds and authority sought for the purpose could be much more readily secured if the state agreed to match them in part, as had been done elsewhere. Labor with the Legislature in Tallahassee was successful in obtaining an appropriation, whereupon question arose as to what Florida agency should be designated to receive the money and direct the expenditures.

Selection of the State Agricultural Experiment Station for the task was quickly decided upon, and quite naturally, considering the record of efficiency in the handling of growers' problems that had been gained by the institution. Cooperation from the United States Department of Agriculture had been forthcoming in most of the endeavors.

Indication that Florida was thus ready to help herself was extremely beneficial when the state's representatives in congress undertook the job of writing into an agricultural supply bill provisions for participation on the part of the federal treasury in financing the desired special service.

Funds for the purpose were soon

placed at the disposal of the weather bureau and establishment of the agency which operates from Lakeland followed shortly thereafter. Nation and state again became joint factors in an undertaking for the benefit of Florida growers.

A Fiftieth Birthday Imminent

Approach of the fiftieth or Golden Jubilee year in the history of the Florida Agricultural Experiment Station, which was established at Lake City during the winter of 1887-88, is a reminder that the institution was largely made practicable by grants of federal funds. In March of 1887, congress had passed the Hatch act, rendering money from the United States treasury available to the college of agriculture in each of the states, for expenditure on rural research.

Resources of the general government were still further drawn on for agricultural experiment stations through the passage of the Adams act in March, 1906. Increases in the allotment to the state of federal monies again were authorized when congress adopted the Purnell act, during February, 1925, and the system that meanwhile had developed also was recognized in the Bankhead-Jones act of 1935.

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How To Combat Acidity In The Soil

R. W. RUPRECHT

CHEMIST AND HEAD OF DEPT. CHEMISTRY
& SOILS, FLORIDA EXPERIMENT STATION

Rather than go into any lengthy technical discussion of what constitutes an acid condition of the soil we will assume that you know what we mean when we talk of acid soils. In the past soil acidity was usually measured in the pounds of lime required to bring about a neutral condition of the soil. At present we measure the concentration of hydrogen ions in the soil and express it as the pH of the soil. It is not necessary to know just what the symbol pH stands for if you will remember that all pH figures from 1 to 7 indicate an acid condition, while figures from 7 to 14 indicate an alkaline, basic, or as some call it, a sweet soil. The pH of exactly 7 indicates a neutral soil, one that is neither acid nor alkaline, or basic. The lower the figure below 7, the greater the acidity. Thus, a soil having a pH of 4 is more acid than one having a pH of 5 or 6. Likewise, the higher the figure above 7 the more basic or alkaline the soil.

Many text books will tell you that for optimum plant growth most plants should be grown in a soil having a neutral or alkaline soil reaction. While this may be true, it is also true that many of these same plants will grow and produce bountiful crops on soil having an acid reaction provided the acidity is not too great. As most of our soils here in the State are naturally acid in reaction, you can readily see what a job we would have on our hands if we had to make them all neutral before we could grow crops. As a matter of fact, it would be the height of folly to change our soil reaction to the neutral point, especially in the sandy section of the State. If too much lime is added to such soils, instead of making them more productive, they are made less so.

Several years ago in one of our experimental fields at the Experiment Station over-liming caused a complete crop failure of both corn and peanuts. Likewise, over-liming citrus groves will bring about an unhealthy condition of the trees which will take several years to correct. Therefore, before you attempt to change the reaction of your soil make sure that such a change is desirable

or necessary.

There are many instances where the judicious use of liming materials will greatly benefit the soil and the crops grown on it. In some cases it may even mean the difference between a crop failure and paying crops. However, do not use liming materials simply because your neighbor had good results from their use. Your conditions may be quite different from his. Don't use liming materials just because you think you ought to. Make sure that your soil reaction is such that liming materials will be beneficial. Most of the county agents can and will be glad to test your soil to determine its acidity and to advise you if liming is necessary, how much, and what kind of materials to use.

The most commonly used materials are lime products and hardwood ashes. Of the lime products, ground limestone, also called agricultural lime and hydrated lime, are most widely used. Rock lime, or burnt lime, has been used to some extent in the past but on account of its caustic properties it is extremely disagreeable to handle, hence we do not recommend its use. Dolomite limestone has recently become more popular due to the discovery of deposits of this material within the State. Dolomite is a limestone containing Magnesium carbonate and Calcium carbonate, whereas, the ground limestone contains only calcium carbonate. Dolomitic limestone is somewhat slower in overcoming acidity than the Calcium limestone. In several experiments where calcium and dolomitic limestone were compared in citrus groves the dolomitic limestone produced better results than the calcium limestone. Whether this was due to the magnesium content of the dolomite or to some impurity present in the dolomite but absent in the calcium limestone has not as yet been determined.

Recommendations for overcoming excessive acidity of soils are generally made in terms of limestone. That is, the recommendations will read:—apply so many pounds of ground limestone per acre. If materials other than limestone are used the quantity

used should be changed. For example, if hydrated lime is used it will require only 74 lbs. to give the same neutralizing effect as 100 lbs. of ground limestone. On the other hand, if hardwood ashes are used it will require approximately twice as much. This difference in neutralizing power between hardwood ashes and ground limestone has in several instances led to overliming when limestone was substituted for hardwood ashes due to the higher price of the ashes. The bad effects obtained then have been blamed on the limestone when in reality it was the quantity used rather than the material that was at fault. Just remember to use half as much limestone as ashes to get the same effect.

Hardwood ashes contain some other ingredients besides lime which add to their value. Chief of these is potash which may vary in amount from 1 to 3 or 4 percent. Small amounts of phosphoric acid and some of the so-called "rare elements" are also present and in certain cases may be as important as the lime.

Several synthetic hardwood ashes have appeared from time to time. These are generally ground limestone with the addition of a number of these "rare elements". Whether or not these compounds are superior to the ground limestone alone depends upon the need of the added elements.

In certain sections of the State near the seashore, shell mounds are found. When these shells are dried and ground they make an excellent liming material. It is hard to tell how much shell products compare with ground limestone in neutralizing power as they usually contain considerable foreign matter which cuts down the lime content. A good grade of shell, free of dirt, etc. should have about $\frac{3}{4}$ of the neutralizing power of ground limestone.

Raw phosphates as a source of phosphoric acid for tree crops are gaining in favor. Some claims have been made that these phosphates will neutralize soil acidity. Preliminary experiments which have been made indicate that they will only neutralize soil acidity to the extent of the

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IMPRESSIONS

.. By ..
Frank Kay Anderson

Rube Garden opines that the frost warning service of this past winter reminds him quite a bit of that ancient musical comedy the Prince of Pilsen. We wondered over that for quite a bit, and then suddenly we hit what we believe Rube was talking about. We recall the Prince of Pilsen distinctly. It was a peach of a show. Mostly it concerned the adventures in high circles of a suddenly rich old German from Cincinnati with a beautiful daughter. He rode high, and then he crashed. With the crash disgrace, and there looked to be no way out for the sputtering, blustering, lovable old chap. He stood before the footlights alone and clutched, shivering, a big, shining revolver. He practiced in pantomime. Then suddenly straightening his shoulders he marched offstage. There was a palpitating moment of dead silence, then the shattering report of a revolver shot. Dead silence again. Then from the wings tottered the old gentleman, still clutching the glittering weapon. He came to a halt down front, and then in a confidential whisper said: "Missed!"

A. C. Fleury, chief of quarantine service for the agricultural department of the state of California didn't see a thing funny in our handling recently of the effort of Nick Belitz of Orlando to make grapefruit shipments to San Francisco. In a long letter he explains practically everything except why it is that Florida admits California citrus fruits in a manner free as air, whereas California in practice blocks Florida shipments into California, even though it is done most elaborately and politely.

Quarantine folks generally are a little short on humor. Mr. Fleury missed our point, which is our failure to understand why our Florida State Plant Board permits California to get away with this situation.

Looks as if there were going to be some provision for federal citrus shipping control after all. At any rate the AAA folks apparently are willing to give Florida the chance, if Florida really wants it. Probably too late to be of any material value this

season, but the machinery may be set up and ready for an early start next season.

Looks as if Congressman J. Hardin Peterson of Lakeland is in a way to make himself the hero of Florida fruit and vegetable interests through his clever handling of the opposition to the cross-state canal at Washington. And rumor has it that Senator Fletcher will not seek reelection, which may or may not put the said Hardin Peterson in a strategic position a little later.

Apropos of which situation we credit Congressman Lex Green, the sow-belly soloist from Starke, with just about touching tops in naivete with his statement concerning the action of the House appropriations committee on canal funds, when he said: "The appropriation wasn't actually taken out, the committee simply failed to include it."

Our last month's output had gone to the printer when the news broke of J. J. (Jack) Kerns return to his first love—fertilizer. Jack really liked the hotel business, and made a real success of putting Jacksonville's Hotel Carling on its feet as president of the organization, but somehow there was something missing. Evenings he would stand about the lobby and glad-hand, and the beautiful ladies would pass, and all was fragrant; but somehow there was something lacking. One day Jack was fishing down the river, the wind was coming right off Hooker's Point over the Wilson & Toomer factory and as the breeze made the boat rock Jack sniffed. Then he knew what it was he had been missing. Next morning he began preparations to reenter the fertilizer business.

The result is the new Rex Fertilizer Co., on the viaduct, at Jacksonville. Ray King of Valdosta, which is in Georgia if anyone wants to know, is president—a go-getting Puritan from Plymouth, Massachusetts, early transplanted to Atlanta, who has made a very substantial success of fertilizer manufacturing in Georgia despite the boll-weevil, the Bankhead Act and

other discouragements. Jack Kerns is vice-president and general manager at Jacksonville, with a whole host of friends among the growers of the state, many of whom never even knew he was in the hotel business.

They picked Herb Lyman of Orlando to be sales manager of the new organization, and he will continue to keep his headquarters in Orlando. That was a "natural", for Herb for some years has been a star salesman for the company which Jack Kerns long afflicted with his presence in executive capacity. Ray King asked Jack if he knew a salesman, and Jack couldn't remember anybody but Herb Lyman.

It is not often that a man makes a distinct success in two widely separated lines of work, but Herb Lyman is one who did. Years, and years ago, when we were a very small boy, the Lyman Twins constituted one of the big theatrical successes of the time. Howard Lyman and Herbert Lyman were the Twins. Howard looked exactly like Herbert; and Herbert looked exactly like Howard only more so. They used to have a lot of fun with audiences all over the country, and the audiences like it. So much so that the twins finally retired, came to Florida and invested their gains in orange groves. Their first crops were satisfactory, but the second year's crop wasn't so hot. So Herbert set out to investigate. A neighbor asked him how much fertilizer they had used per tree, and Herb was astonished. He came home and reported to Howard, "Say do you know they sell b.s. down here and get real money for it, all the growers have to buy it. By golly, we're going into the business."

So they did, and prospered. We used to puzzle over how it was that a couple of actors could be such a success as fertilizer salesmen. We thought maybe it was just because they were such plumb good fellows. Finally, however, we got the real explanation. It was a short time after Howard's untimely death by an accident at Pass-a-grille. We were over

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How And Where To Borrow Citrus Production Money

BY A. E. PICKARD

PRESIDENT, ORLANDO CITRUS PRODUCTION CREDIT ASSOCIATION

The answer to the inquiry, "How and where to borrow citrus production money?" is, "Get it at your own Citrus Production Credit Association, commonly known as the Citrus Growers Bank, at Orlando, Florida, merely by complying with the regulations of that institution." Some of you may say, "I did not know there is such a bank." Others may say, "I have heard of it, but I do not know if I can borrow from it or not." Still others may not have been able to use its credit facilities because of other affiliations. I trust this brief statement may give you just the information you are looking for.

Two years ago there were organized in Florida, with the assistance of officials from Washington and Columbia, two credit associations exclusively for citrus growers. The first of these was at Orlando; the other at Bartow. After about a year and a half of independent operation, the two institutions were merged in the interests of economy of operation and efficiency so that the Orlando Citrus Growers Bank is now ready to meet the needs of the citrus growers of the entire state. This institution is part of the Farm Credit Administration, headed by Governor Myers in Washington. The parent organization is the Production Credit Corporation of Columbia, South Carolina, the president of which is Mr. Ernest Graham. It is closely affiliated with the Intermediate Credit Bank of Columbia, which purchases, or discounts, the loans of the local institution.

Unlike in commercial banks, every borrower of the Citrus Credit Bank becomes a stockholder to the amount of five per cent of his loan. If and when the grower no longer is a borrower he may, if he so desires, have his stock transferred to a new borrower. No individual who is not a borrower can own stock in the bank. Thus it is controlled and partly owned by the growers themselves. I say, partly owned, because originally the capital was subscribed by the Production Credit Corporation of Columbia. This capital is in the form of class "A" stock and is invested in 4%

federal farm mortgage bonds, which are sold to the investing public. The grower owned part of the capital is known as class "B" stock. It is also invested in the federal farm mortgage bonds drawing 4% interest. The income of your citrus credit bank is, therefore, from the sources just named, plus the interest paid by the borrowers. This latter is worthy of emphasis. For the first time in the history of the citrus industry, so far as I know, your own bank has made it possible for you to borrow your production needs at the hitherto unheard of low interest rate of five per cent a year. Not only that, but borrowers are permitted to budget their loans, getting the amounts as needed during the season, and paying them off as the fruit is marketed, thus paying interest only such time as the money is actually in use in the production of the crop. The maximum time for any one loan is one year and the loan is strictly for crop production purposes, such as fertilizer, labor, spraying, dusting, etc.

From what I have already said, you can see that the set-up is a good one. It is safe and permanent. It is owned jointly by the growers themselves and the Production Credit Corporation, under government supervision. As the volume increases, the growers will own more and more of the stock until eventually they can own it themselves. For your information the Orlando Citrus Growers Bank has authorized capital of a half million dollars, two hundred and seventy-five thousand of which has been paid in, in cash. The growers own approximate twenty-five thousand dollars of class "B" stock. You will be interested to know that during the short period of about two years, since the time the bank was organized, it has met the financial needs of some four hundred seventy-five growers and loaned \$723,175.00. That includes both institutions before and since the merger of a few months ago. In view of the most adverse conditions in the industry a year ago, and of getting a new organization under way, it would seem that is a very good rec-

ord. Practically all of these loans were paid up in full. Part of a few loans had to be carried over, but we do not anticipate any loss whatever in spite of the growers' losses a year ago. In fact, the stock of the Orlando Citrus Growers Bank has increased in value, and is now about 20% above par.

This explanation will convince you that the growers have already a financial institution of which they may well be proud. It is now ready to begin its third season and is ready to take care of any responsible grower. Its financial structure is such that it can furnish production loans to every citrus grower in Florida who can qualify for a loan, regardless of the amount. Last year the loans ranged varying amounts in between, many from \$100.00 to \$60,000.00, with only a few hundred dollars—others for ten, fifteen and twenty-five thousand dollars. So, we have served large and small growers alike. The average of all loans is \$1510.00 since the Citrus Growers Bank was organized.

According to an official survey a year ago, there are 21,000 commercial citrus growers in the state. If everyone needed to borrow at that same rate, it would require nearly thirty-two million dollars to finance them. As there are no figures available, it is idle to even suggest the amount actually borrowed annually. It is safe to say, however, that this new growers' bank, with its strong set-up, and unlimited funds, meets a long felt need. It has already several worth while achievements. It has reduced an intolerable interest rate to five per cent. It has brought new money into the state and made it available to citrus growers. It is providing sound, serviceable and permanent production credit to the industry. It is not antagonistic to, nor in competition with, any of the existing agencies that have loaned or advanced money to the industry as a whole. This is a growers' bank, many cooperative, as well as independent packing houses, are glad to have their growers finance themselves through this new citrus bank, instead of the

packing plant, as many did previously. Some associations have discontinued making direct loans to growers who can now obtain funds through this bank.

If I have succeeded in convincing you that here is a permanent credit institution, set up for you and the other growers and that from now on you should make full use of it, you want to know how to borrow the money. Please follow me closely and I shall try to give you each step in detail. If you are close enough to Orlando, drive in and see the officials personally. They will be glad to meet you and to take care of you at the bank. If you are too far away to do that, see your credit agent, who will give you an application blank and assist you in filling it out. Mail this application to the Orlando Citrus Production Credit Association in Orlando. As soon as possible, generally, within three or four days even in the "rush season", a representative of the bank will call on you to inspect the groves and make an estimate of the crop.

His official report is immediately submitted to the executive, or loan, committee of the board of directors. Upon approval, all papers required in connection with the loan are drawn up by the bank and mailed to the borrower, which he executes and returns to Orlando. These papers are the note for the amount of the loan, crop lien and mortgage. If more money is needed to produce the crop and care for the grove than the present crop will warrant, it may still be obtained, if there is adequate additional collateral.

Many growers have asked if they are eligible for a loan if they already have a mortgage on the property. The answer is "Yes", if the existing mortgage is to the Federal Land Bank or Land Bank Commissioner, no action on their part is required. If it is to someone else, then a sub-ordination is necessary.

Upon the arrival of the completed papers at Orlando, the first part of the budgeted loan can be sent to the borrower at once from the cash loan fund. Later, this paper is re-discounted at the Federal Intermediate Credit Bank of Columbia.

In brief, those are the steps in order to complete a loan. The time necessary from the receipt of the application until the borrower gets his money will average about ten days, depending upon the location of the borrower and the dispatch with which bank urges all prospective borrowers to start their applications early so that a few days extra will not incon-

venience them, as there may be a slight delay during the "Rush Season." The first loan requires more details and takes longer than subsequent loans.

The information given to the representative of the bank who makes the inspection is confidential and will not be divulged to the public. His report to the loan committee is also confidential. As with other financial institutions, after you have established a line of credit with the credit bank, it is easier to get your loans through later on, for your further information, the application includes the following:

Financial statement — Production Record of Grove — Number and Variety of Trees — Purpose for which money will be used — How budgeted — Dates of repayment.

All loans are payable from crops as marketed, but borrower selects his own marketing agency. He may if he so desires sell on the trees, remitting the proceeds as received to the association. Obviously, there are certain incidental costs which vary somewhat in the different counties. The standard cost of the inspection is 1% of the loan up to \$1500.00, above that, is on a decreasing graduated scale. Recording the crop lien varies from \$1.25 to \$1.75. The cost of cer-

LANDSCAPE FORESTRY WILL AID GREATLY IN BEAUTIFYING FLORIDA

Gainesville, Fla. — Florida needs pioneers and leaders in the field of tree planting and care of city streets, parks, cemeteries and home grounds, students in forestry at the College of Agriculture were told recently by J. J. Levison, consulting landscape forester of New York. By virtue of the fact that it is rapidly becoming the nation's playground, there is a demand for beautification work on all sides in Florida.

He urged the acquisition of park sites while they are still available and their development as the cities grow. Also, street and cemetery plantings and care demand attention, he said.

Mr. Levison pointed out the facts that Florida's climate will support growth of almost any type of tree, and that there is a wealth of material from which to choose for plantings.

A course in ornamental and municipal forestry at the University of Florida will be well worth instituting, in his opinion, and should include foundation studies in forestry, with special studies in ornamental plant

tificate of ownership is from \$3.00 to \$10.00, depending upon the fee charged by your abstract company or lawyer.

In closing may I say a word about the management of the Orlando Citrus Growers Bank. It is governed by a board of directors of citrus growers from different parts of the citrus belt. These directors are elected by the stockholders, who are the borrowers, at the annual meeting. The directors elect their officers and choose the bank personnel. None of the directors, including the speaker, receives any remuneration whatever for his time and services. The executive secretary and his efficient corp of helpers, who conduct the detail work of the bank, receive modest salaries. A good reserve is being built up and just at present an insurance plan is being considered that will protect not only the credit bank, but the grower as well.

I trust I have given you the desired information and most cordially invite you to visit the home institution at Orlando, or get in touch with your county agent who will be glad to help you. Now is the time to make your application for a loan and may we urge you from now on to use your own Citrus Growers Bank for your financial needs. Get your credit established now.

materials, practical entomology and plant pathology, soils and fertilizers, landscape design, pruning and repair of trees, fruit growing, methods of planting and caring for estates, city streets, parks and cemeteries, and related subjects.

Mr. Levison is a graduate of the Yale School of Forestry and was for 10 years chief forester for the City of New York.

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CONTROL OF CITRUS DISTRIBUTION

Citrus Control Commission

Quoting an editorial which appeared in the December issue of The Citrus Industry, the Texas Citriculture and Farming gives its endorsement to Federal control of distribution in the following words:

"Though the outlook for firm citrus prices at fair levels throughout the remainder of the shipping season is good, a serious break in prices during the first months of the season, due to overloading the markets, has given rise to a wide-spread belief among Texas growers, and numerous shippers, that the only effective means of avoiding a recurrence of the disaster next season is to enter again into a marketing agreement with the U. S. Secretary of Agriculture.

"It will be remembered that the endeavors of the control committee under the agreement in operation last year were more or less frustrated by an element among the shippers which was apparently more intent upon volume, for the sake of the packing profits, than upon satisfactory returns to the growers. Investigation of the operations of these shippers was under way when a decision by the U. S. Supreme Court raised a question as to the power of the Secretary of Agriculture to inflict penalties under these agreements. In view of the decision, the investigations were abandoned.

"A new form of general citrus agreement has been prepared in which the constitutional objections are believed to be overcome and which provides that any committee created for the purpose of controlling shipments in the interest of price stability shall be composed of a majority of growers and not shippers.

"After about three months of hearings and discussions in California and Arizona, the California-Arizona Citrus Marketing Agreement was endorsed by a large majority of the growers, was signed by their representatives and by Secretary Wallace and was put into operation on January 13. A consensus of authoritative

opinion in California is that the recent U. S. Supreme Court decision, which has such a shattering effect upon many of the activities of the AAA, will not interfere with the citrus agreement in its application to interstate commerce.

"Powerful expressions of their attitude by many influential citrus growers in Florida indicate that most of the producers in that state are as strongly in favor of a marketing agreement with the Secretary of Agriculture as are their fellow-growers in California and Arizona. The editor of The Citrus Industry, published in Florida, dealt with the subject in the December issue of that representative magazine.

"There is an emotional quality in these words from Florida, and Texas growers who look ahead are likewise concerned over the prospect next season of a record-breaking crop and heart-breaking prices unless the Texas citrus industry enters the season under the protection of a Federal agreement. A tentative agreement was submitted here by a representative of the government a few months ago, but prices were then fairly good and a plan for centralized selling was uppermost in the minds of so many growers. For these reasons the time was not auspicious for considering a new arrangement with Uncle Sam. Toward the end of this season, however, when activities in the markets are subsiding, the Texas citrus industry should by all means, in the opinion of a large number of its most thoughtful members, turn again to the working out of a Federal agreement that will fit conditions and will provide growers with substantially increased strength in the marketing of their product.

"It is considered well to accept in this matter the guidance of the California industry, which has built a strong bulwark of cooperation in citrus marketing and has added to its resources in fair price maintenance in interstate shipments by utilizing some of the power of the U. S. Department of Agriculture."

As this issue of The Citrus Industry goes to press a meeting of representative citrus growers and shippers of Florida is being held in Lakeland to consider a tentative agreement for the control of distribution through a plan for the control of volume, prorate and grade, under the direction of the Citrus Control Commission.

The tentative plan, sponsored by Governor Sholtz, has the support of leaders in all the various citrus organizations of the state and hope is expressed that the agreement may be put through in time to put it into operation before the close of the present shipping season.

The radio has been brought into play by the Florida Citrus Commission to tell the people in Northern states where epidemics of Influenza and pneumonia prevail, of the beneficial effects of Florida oranges and grapefruit in combatting these diseases. Broadcasting stations in sixteen metropolitan cities are being used to tell the health story of Florida citrus fruits on daily and nightly programs. Dr. John Harvey Kellogg is being quoted as an authority in these programs.

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ASSOCIATE ENTOMOLOGIST, FLORIDA
EXPERIMENT STATION

Every one knows that there are a great many different kinds of insects in Florida and that many of these are very serious pests. Few people, however, are aware of the enormous loss that year after year must be charged to insect depredations. Neither do they realize the important role that is played by insect control in keeping down insect damage and protecting our crops and livestock from total destruction.

It is not possible of course to measure exactly the damage caused by an insect pest or to state definitely the loss caused by it. However, workers in the United States Bureau of Entomology have made careful studies of insect damage over a period of years. They estimate that insects cause a loss of at least 10 per cent in cereal crops including corn, 20 per cent loss in truck crops, and 15 per cent loss in fruit crops. Using these estimated as a basis for our calculations let us see how much insect pests cost Florida. A conservative estimate of last year's citrus crop is 40 million dollars and a loss of 15 per cent amounts to 6 millions dollars. The yearly value of the truck crops of the State is at least 25 million dollars and if insects destroy 20 per cent of the truck we have a loss here of 5 millions dollars. Florida's corn is worth 5 million dollars a year. Insects cause a loss of at least 10 per cent, and probably more when we consider the damage caused by weevils and other insect pests in corn stored in the crib. The damage to corn thus amounts to a half million dollars per year. Adding these figures we find that we must charge to insect pests, damage amounting to 11 and a half million dollars a year. If we consider the damage to other crops, to livestock, to our houses and other buildings, food products and clothing we must add a few more millions. And finally the loss in human life and health from malaria and other insect borne diseases must be added to the total levied upon us by insects.

This recital of losses caused by insects might lead one to think that

little or nothing is being done in Florida to prevent damage by insects. This is far from the truth, however, for if control measures were not constantly employed the losses would be inconceivably greater than at present. It is like-wise true that if suitable control measures were more generally employed the losses now caused by insects could be very greatly reduced.

Insect control is much more complex and has a much wider scope than most people realize. Let us briefly mention some of its phases and see how they serve to lessen insect damage and save money for the growers of Florida.

One phase of insect control is designed to limit the spread of insects or to eradicate some insect from an area where it has just been introduced. Under this heading come all quarantines, both state and federal, and all clean-up campaigns that have as their objective complete eradication of an insect pest. In a clean-up campaign all ordinary control measures are used and these are supplemented by practices that are possible only in limited areas and under extraordinary conditions. Nearly everyone remembers the Mediterranean fruit fly campaign in Florida. This insect had somehow entered our state and become established in the heart of the citrus belt. If this pest had been allowed to remain it would have cost the citrus growers dearly, in actual destruction of fruit, loss of markets, and the expense of processing their fruit before they could ship it to other states. As soon as the fly was discovered the federal and state entomologists began to make plans for an eradication campaign. This campaign was quite successful, all the flies were destroyed, and now the citrus and other fruit growers are spared a great deal of grief and are saved millions of dollars.

Quarantines have a much wider application than clean-up campaigns. They are designed to protect unfested areas from pests which occur elsewhere and which if allowed to en-

ter might establish themselves in new territory. Quarantines are especially important in Florida with its long coast line, its great extent from north to south, and the diversity of its crops.

A second phase of insect control can be listed under the heading of cultural practices. Under this category we include such things as crop rotation, trap crops, time of planting and weed control. Next to the complete extermination of a pest the most nearly ideal method of dealing with it is to so modify the ordinary cultural practices for the crop involved that they will, without added expense, eliminate the damage done by the insect. Of course this ideal is rarely if ever attained but in many cases such practices reduce the injury to such an extent that more expensive methods of dealing with the pest are not justified. Cultural practices, more than any other method of control, involve exact knowledge of life histories of insects. In order to apply them intelligently one must know just where the insect is at all times and at just what point in its life history it is most susceptible of control by modifications of methods of handling the crop.

Crop rotation is most applicable for the control of insects which have a single host plant or a few closely related plants. When a crop is grown year after year on the same field the insect pests of that crop become greatly concentrated in that area and cause a great deal of destruction. If the crop is moved from field to field the insects are unable to follow without greatly reducing their numbers.

Insects that feed on a variety of plants often show a decided preference for one particular kind of plant. Putting the favorite food plant along with the main crop which is to be protected will often afford a high degree of protection to this crop. In this way summer squash is sometimes planted around the edges of cucumber or cantaloupe fields to protect them from melon and pickle worms. The adult moths of these two insects seem

to prefer the squash as a place to lay their eggs with the result that the cucumbers and cantaloupes largely escape infestation.

It is sometimes possible to so time the planting of a crop that it will escape the peak of the activity of its insect pests. This may sometimes require early planting while at other times late planting may be advisable. Practically the same results may be attained by planting an early or late maturing variety as the case may require.

Insect pests may feed on weeds as well as on cultivated crops. Certain weeds may serve as reservoirs for insects during periods of inactivity of the crop. A good example of this is of the green citrus aphid. During the winter when citrus trees are dormant this aphid lives and multiplies on the white flowered Spanish needle. Later when the new flush of growth appears on the citrus, the aphids migrate to the trees in large numbers and quickly curl the new growth. Thoroughly ridding the grove and bordering areas of this weed will help greatly to prevent the early infestation of aphids and prevent much damage.

Still another phase of insect control is that which is known as biological control. Under this heading we shall list the growing of resistant plants, the utilization of predacious and parasitic insects and fungus and bacterial diseases of insects. A large portion of all insect control is accomplished by these natural factors. To a large extent these factors are beyond the control of man but not entirely so. In Florida we have some very good examples of how man has utilized and is still employing natural agencies for the control of injurious insects. Perhaps the best known is the control of the cottony-cushion scale by the Australian ladybeetle. Other familiar examples are the control of mealybugs by the cryptoloeus ladybeetle and the control of scale insects and whiteflies by the friendly entomogenous fungi.

There is still another type of insect control which is so familiar to everyone that it needs but brief mention. This may be defined as artificial or chemical control. This type of control depends entirely upon the operations of man and is the most widely employed of insect control practices in conditions of intensive culture such as are found in many of the truck areas of Florida. In general this type of control consists of spraying or dusting the plants with some material that will either kill the insects or drive them from the plants. Fumigation is another common meth-

A Resume Of Insect Conditions In Florida In 1935 - And Some Pointers For 1936

J. R. WATSON

ENTOMOLOGIST, FLORIDA EXPERIMENT STATION

Taking up first citrus insects, the first big event in the insect world was the result of the freeze of December 12th, 1934. The Florida red scale was the worst hit by this freeze. Where trees were practically defoliated the Florida red scale was exterminated. Since this scale is confined to the leaves and fruit, defoliation gives as thorough a clean-up as fumigation. Even where defoliation was only partial the vast majority of this scale was killed. Purple scale went through the freeze better, although when the temperature dropped to 23 degrees F. or lower there was a high mortality. Rust mites were apparently not as seriously affected as in previous freezes, although doubtless many were killed. In some groves where the temperature dropped to 23 it was necessary to dust for rust mites within ten days after the freeze.

The green citrus aphid got a pretty good start during the latter part of the spring flush of growth. Some trees which were late in putting out their growth, like tangerines, were pretty badly curled in many cases.

One cannot make any predictions safely as to what will happen to an insect for any length of time in the future. There are too many factors involved which may affect insects, including the weather conditions. However, we may say that if January is warm with enough moisture to start some growth on young trees growers should be on the lookout for aphids in the spring. In fact, they should

take measures to keep them down during January, at least.

An unusual but not alarming rise in the number of woolly whiteflies has taken place in the last month or two. As we told you recently, it has been twenty years since we have had a bad infestation of this woolly whitefly. The complaints are still coming in. Evidently the little wasp-like parasite which ordinarily holds them in check is not as abundant as usual this fall. It is not likely that this whitefly will become abundant enough to make spraying necessary or profitable, except in a few exceptional groves. Should it do so, the best time to spray will be late January or early February, just before the new flush of growth starts, using an oil emulsion. At that time the whitefly will be in the early larval stages, which is the only stage when one can get effective control by spraying. It is probable that lime-sulphur also would be effective, but we have not had an opportunity to test this. However, on the whole, the insect, when not protected by the wool, is more delicate than the common citrus whitefly and should be more easily controlled with lime-sulfur spray. This spraying would correspond with the spraying of Bordeaux for scab on grapefruit. The two can be combined by a Bordeaux oil spray.

This past fall has been characterized by unusually persistent attacks of army worms on cover crops in citrus groves. We frequently have one or two generations of army worms in the late summer and early fall, but this year they started in August and persisted up until the present time. Usually after a generation or two of abundance their parasites gain control, but for some reason or other this control has been slow this year, with the result that the cover crops in some citrus groves in many sections of the State have been stripped of leaves. This probably is not a serious matter as the cover crops is commonly disked down in the fall of the year, and we have no instances where these army worms have attacked the trees

od of chemical control. This is employed in the destruction of household insects and those that damage corn and other stored products.

It is quite certain that mankind will have to contend with insect pests as long as he cultivates plants, raises livestock, and accumulates food and other materials for future use. Insects will continue to take their yearly toll, but this can be reduced to a very small amount if man will intelligently employ the best control measures at his disposal.

Insects, Injuries & Beneficial

themselves.

In the control of citrus insects the tendency to use lime-sulfur for a combination spray for rust mites, scale insects and whiteflies continued. The addition of wettable sulfur, four or five pounds to 100 gallons of lime-sulfur solution, was widely used. This is an excellent spreader and by increasing the sulfur content makes control of rust mites more thorough.

Turning to the insects of truck crops, probably the discovery of the pepper weevil in Manatee County was the most striking thing of the year. Pepper weevils are an introduction from the west, occurring from Texas to California and Mexico. They are a very severe pest, being closely related to the cotton boll weevil and working on peppers very much in the same way the boll weevil works on cotton. By June it was responsible for complete destruction, not only of the peppers but even of the blossoms. Upon our earnest solicitation the growers in the County made a very thorough clean-up, with the result that we have not found a single pepper weevil since August. Although it is too early to even hope that we have exterminated the pest, still it has received a severe jolt at the hands of the growers, and we have learned that it can be at least thoroughly controlled by the destruction of the pepper fields when the picking season is over, so it is no longer a pest which we need greatly fear.

The first part of this year, from January to June, was dry, the rainfall was very much below normal. This condition of affairs was fine for thrips, which became very abundant in the latter part of the spring. The chief offender was the onion thrips. Always abundant on onions, it spread to peas, beans and even to celery. It did much damage to late celery. The Florida flower thrips also helped, being responsible for much damage to beans, not only to blossoms but even the leaves were badly curled. If the dry conditions of last year are re-

peated this coming year, growers of peas, beans, celery, and even cabbage should be looking for thrips and not let them get too abundant. In most situations they can be killed by a three or four per cent nicotine sulfate lime dust, applied at a quiet time; or better, one of the pyrethrum compounds, either as a spray or a dust. The trouble is often, as in the case of celery, to get at the thrips. They, of course, must be hit if you are to get control.

The rise in numbers of the thrips came most too late to be a serious matter on citrus, as the bloom was largely over before they became numerous. As a precaution another year against an infestation of thrips in blooms, all weeds which are liable to bloom in or near a citrus grove during the winter should be cut. Doubtless the freeze of December 12 which killed most tender vegetation in citrus groves was responsible for the thrips getting such a slow start in the spring.

The army worms which we have mentioned as so common on cover crops did some damage to vegetables also, particularly early celery in some sections. This is the semi-tropical army worm. Bean jassids were bad in the fall of the year. The belted cucumber beetles, a comparatively recent arrival in Florida from the West, was responsible, according to a correspondent, for the destruction of twenty acres of lima beans. This insect is apparently increasing in numbers and our growers should keep a careful watch on it. One of the pyrethrum or rotenone compounds would be the proper means of control on vegetables where arsenicals cannot be used. This applies also to cabbage worms on cabbages that are beginning to head.

Among the pests of live stock the screw worm continued its depredations and spread in larger numbers to the southern part of the State. However, our farmers are learning to combat this pest, to keep a better watch on their live stock and promptly treat all open sores.

Although the first of the year was unusually dry, the latter part of the summer was unusually wet, with the result that mosquitoes were very abundant and troublesome. Here is one pest that, unlike the weather, we can do something about. Draining ponds and marshes is, of course, an expensive proposition but one well worth while, and the job that Florida must undertake if we are to preserve our health.

CASH INCOME FOR FARMS IN 1935 SHOWS RISE OF HALF BILLION OVER 1934

Sales of farm products plus rental and benefit payments brought a total of nearly \$7,000,000,000 in income to the farmers of the nation in 1935, according to a report to the State Agricultural Extension Service from the Bureau of Agricultural Economics in Washington.

The Bureau estimated total farm cash income of 1935 to be \$6,932,000,000, or \$545,000,000 more than that of 1934. Farm cash income of 1935 was \$2,604,000,000 more than that of 1932, the low year of the depression.

Cash income from sales of farm products in December 1935 totaled \$598,000,000, or \$62,000,000 below the income in November 1935, but \$125,000,000 above that in December 1934, the Bureau report said. Farmers received in addition \$47,000,000 in December benefit payments, compared with \$56,000,000 in November, and \$53,000,000 in December 1934.

Income from sales was higher in every month except July in 1935 than in 1934, but the greatest increase occurred in the last quarter of 1935. A part of this increase was attributed to increased sales from the larger crop production in 1935.

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IMPRESSIONS

(Continued from page 7)

at Herb's one evening. We were both tired and things dragged. Finally Herb got out the family album and began showing us the pictures. You know. The old stuff: "That's Aunt Lucy; that's Niagara Falls behind her. That is Cousin Jake, the one at the left; the one at the right is his dog Ipswich. Etc." It was when we got through the book and closed it that I noticed the handsomely embellished coat of arms of the Lyman family on the plush cover, and the motto: "You drive, and I'll spread."

Even though frozen orange juice proved to be something of a dud, the freezing process as applied to fruits has become sufficient of a success that last year approximately 75,000,000 pounds of such frozen fruits were put up in the United States for commercial purposes, about four-fifths of it in the Pacific Northwest. Strawberries and raspberries are the leading items, but lesser amounts of loganberries, and black berries, and small quantities of black raspberries, currants, gooseberries, prunes, rhubarb, huckleberries, read sour cherries and apples find a market in this way. The outlet is with preservers, soda fountain supply makers, bakers, ice cream manufacturers, and fruit juice makers supplying the hotel and restaurant trade.

Out in California they are still quick-freezing orange juice, but to a very limited extent, it is reported; and the market is highly specialized. Frozen orange juice doesn't seem calculated ever to catch the public favor.

The death of J. Reed Curry of the Exchange came as quite a shock to us, even though we knew he had long been ailing. Somehow we didn't realize the serious nature of his illness. Only a few months back we got a wheeze out of the mule-feed diet that his doctors had put him on. We saw him briefly just about two weeks before his death, and to our notion he was looking better. We thought even then he looked more physically fit than most men; and that was where we were wrong.

A carry-over from the days of Dr. Inman, Reed Curry held down the job of Organizer over a long period of years. The title itself is reminiscent of the early days of the cooperative, when it was necessary to or-

ganize new associations everywhere. That was the duty which gave the position the title it has held since the origination of the organization. That same title always puzzled a lot of people, particularly the newspaper men. Invariably they spelled it with a small "o" which induced many to believe that Reed Curry was the originator of the marketing organization. Long ago he gave up trying to issue corrections. It was just a sort of misapprehension that went with the job.

Reed Curry was a gentleman of the old school. With his brother Howard, now dead several years, he came to Florida many years ago from their native Bardstown, Kentucky. Howard long was Development Agent for the Seaboard Air Line with headquarters at Tampa, and on the side used to hit some pretty good licks for the Exchange. Bardstown, some will recall, was the scene of the story "The Limestone Tree" that Joseph Hergesheimer wrote; and if ever you read "The Limestone Tree" you can understand the fine type gentleman that Reed Curry was, and why many are going to miss him muchly.

He was a natural, and inalienable optimist, even though his optimism frequently got him into places where he would have preferred not to have been. It was Reed Curry's optimism years ago that got C. E. (Ned) Stewart and this writer along with some others into the oil well business. The oil well was in Kentucky, and when later we examined closely in the matter we found it was because the well was in Kentucky that Reed Curry was so optimistic. The well hit oil, which was justification for the optimism. But instead of being a gusher it was a mere trickle. Anyhow we all sold out for precisely what we had in the undertaking. The late comers held the bag.

Shrinkage gradually from over twenty millions of bushels of apples exported from the U.S.A. for the season of 30-31 to less than eight millions of bushels shipped outside our borders in the season of 34-35 shows the plight of the apple producers with respect to their export trade. After fifty years of careful nursing and constructive development, the apple export business had a severe shock due to tariff walls, quotas and things of the sort. More recently, however, many countries abroad have begun to show greater liberality, with the result that apple exports once more are on the upturn. The situation with re-

spect to an established export article like apples still presents sufficient discouragement to argue against any undue expansion in citrus exports in short order. Not many realize that apples had become sufficiently a staple in world markets that in point of raw products the volume of their exports was exceeded only by wheat and cotton.

Certainly gratifying to hear of the "miraculous" escape of B. C. Skinner and his party in their plane crash in New Mexico. Glad that reports showed Miss Vivien Skinner's injuries less serious than at first anticipated. Wonder if a clear head and the unshakable nerves of B. C. Skinner didn't play quite a part in their escape, which another aviator classed as a "miracle."

For a good, steady-going guy we'll pick Bronson C. Skinner any time, albeit we are not much more air-minded than a gopher. The way he has been commuting back and forth over the map of these United States for all these years without difficulty is a pretty good testimonial to his mental and physical equipment as a

(Continued on page 18)

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FEDERAL-STATE JOINT EFFORT FOR FLORIDA CITRUS GROWERS

(Continued from page 5)

Cooperation between the federal and the state authorities engaged in experimental work for the benefit of farmers and growers thus has been progressively built up. Application of the idea under the United States Weather Bureau has been on a less extensive scale but followed logically when extensions of the service were made that particularly affected agriculture in limited areas.

Extent of the operations in the Florida Agricultural Experiment Stations pertaining primarily to citrus fruit, on which the Federal Department of Agriculture is assisting, is revealed through the annual reports of the first-named institution. Identification of each project is made in such manner, by means of these records, that the joint-sponsorship readily becomes apparent whenever it exists.

Included in the agricultural economics studies financed jointly by the nation and the state are found, for instance, useful undertakings of considerable number. Farmers' cooperative associations, cost of production and grove organization for Florida citrus, cost of handling fruit from the tree to the car and precooling and refrigeration in transit are among them.

Entomology department activities with citrus representing joint backing are featured by investigations of the green aphid. In the horticulture division work has proceeded on cold stor-

THE CITRUS INDUSTRY

age, maturity, effects of zinc and other unusual mineral supplements. Pathology branch research covers mushroom root rot, decays in storage and Tahiti lime bark disease.

Chemistry and soils workers are studying, in a cooperative manner, the effects of potash or composition and yields of citrus and the reactions from various grove fertilizer formulas. Stem-end rot origins and causes have been sought at the Citrus Experiment Station in Lake Alfred, as a common endeavor of the cooperating federal and state agencies.

Inquiry into conditions bearing on other crops than grapefruit, oranges and tangerines likewise have been freely supported by joint allotment of funds. Reading of the Station yearly reports will disclose the extent of the associated endeavor by the explanatory reference to projects. If they are primarily state ones, this fact is indicated, but these, too, have supervisory federal assistance.

Demonstration work in respect to fruit growing, as carried on in the affiliated institution, the State Agricultural Extension Service, likewise is jointly sponsored. Outstanding examples are supplied through the activities of the citriculture specialist at headquarters and the county farm agents in the grove belt, covering the essential problems of the industry.

Regulatory measures in plant pest and disease control or elimination of major importance are administered, furthermore, by state bodies accorded assistance from federal sources. Citrus canker and Mediterranean fruit fly eradication, which the Florida State Plant Board directed under its police powers, received United States aid, in money, quarantines, personnel and supervision.

Facts on Frost Freeze Service

When the news came from Washington and Tallahassee that fifteen thousand dollars in federal funds and ten thousand of Florida money would be available during the 1935-36 fiscal year for the special forecasting service, the good people of the citrus belt insisted upon inauguration of the undertaking with a minimum of delay. Sentiment in favor of this prompt initiation of the system was much too strong for the authorities to ignore it, even if they had been so disposed.

Decision on their part to go ahead whenever dangerously cold weather arrived was reached, however, with some misgivings, and they announced in the beginning that the service would be on an experimental basis the first year. Factors complicating

February, 1936

the situation were numerous, prominent among them the absence of accurate, complete and detailed records on previous temperatures in the territory which was to be protected and the lack of correspondingly full data on the behavior of cold waves during preceding seasons, while they were headed toward Florida.

Handicaps additionally were placed on the proposed service by the limited amount of money which could be utilized in its establishment. Not enough has been at the command of the Federal-State Horticultural Protection Service, unfortunately, for it to receive by telegraph reports from field stations and collaborating volunteer observers on the temperature variation in the different fruit-producing localities of Florida during periods of threatened damage.

Inability to pay for wires repeating the radio messages arriving at central weather bureau stations from vessels in the Gulf of Mexico and off the South Atlantic coast is an equally serious obstacle. Movements of counter disturbances and pressure areas originating in these waters frequently modify low temperature conditions headed for Florida from the north and west. They repeatedly have averted serious disasters.

Influences exerted by the sea enveloping the Florida peninsula are of primary importance in respect to weather conditions. Length of her coast line is an asset to the state in climatic connections far more significant than latitude or longitude.

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Knowledge relating to the phenomena developed in the adjoining waters would be immensely helpful if it could be had from the very early stages.

Margins of safety therefore have been necessarily included in the findings of the Horticultural Protection Service at Lakeland and these must continue to be reckoned with in its operations so long as lack of any essential information is unavoidable. Values inherent in the forecasts supplied doubtless will lead to the correction, ultimately, of deficiencies respecting the wherewithal furnished for maintaining them.

Features of peculiar interest have been developed in the first season that the federal-state system of temperature warnings was operating. Folks even have been so thoughtless as to condemn the director when the mercury failed to fall to minimum figures he had predicted were possible. Stress should be laid, by the way, on the fact that predictions are made only in respect to mercury levels and affecting conditions.

Communities that prefer not to have the outside public know it if they are threatened with damaging cold have been omitted from the list of localities for which forecasts were supplied, upon request from organizations believed to properly reflect the local feeling. Growers in these sections must then obtain the information by direct communication with the Lakeland offices.

Cooperation extended by newspapers and radio stations is reported as having been highly gratifying and satisfactory. Commendations from fruit and vegetable growers, vitally and primarily concerned, apparently have greatly exceeded the criticisms of non-agricultural interests fearing adverse effects on tourist travel or realty transactions.

Soldiers entering action for the first time are referred to in military circles as having "baptisms of fire" ahead of them. Nature provided a baptism of cold for the introductory period of the Florida frost-freeze warning service when she made the 1935-36 winter the most severe in many years.

Beggarweed is usually planted in May or June, seeding at the rate of 10 to 12 pounds of hulled seed per acre, or 20 to 30 pounds of seed in the hull per acre. The usual method of planting is to sow broadcast and cover lightly with an Acme or spiked-tooth harrow.



GROWERS

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IMPRESSIONS

(Continued from page 15)

flyer.

Right here, by way of a change, perhaps we'd better tell a yarn on ourself before Friend Wife gets everybody told, one by one. It was a bright afternoon, and along with our family we were circulating about over West of Orlando in that Stinson he used to fly, when we thought we ought to make a little conversation. So we commented upon the fact that the bus rode the air more or less like a Pullman Palace Car rides the rails. B. C. Skinner was pleased. "Yes," he said, "and that isn't th best of it; this plane flies practically automatically." With that he kicked his feet loose, released the wheel and turned sideways in his seat to face us where we sat up front with him. Sure enough the plane flew along smoothly, evenly, and did a real good job of running itself. Not a thing happened. For several minutes he sat thus sideways and talked to us. We didn't say anything. We wanted to say something like, "For Pete's sake turn around and take hold of that thing, and I'll give you my watch." But we didn't trust our voice.

We deny as a libel our wife's side of the story, which is that during this period our hair stood straight up from the roots, even though she drags in our children to prove it, and they swear to it.

Recently we have been out of the running in things citrus so much that we have missed a good bit of what has been going on, but we have noticed that the usual crop of abilis concerning the market came forth at just about the usual period, and along about the middle of January the market began to breathe slowly preparatory to getting on its feet later, as it has done now for quite some years. Of course these market variations depend in good part upon the weather, both at the shipping and receiving end. This year the weather at the receiving end has materially hampered distribution over long periods. Yet by and large, the market price curves are pretty much the same from year to year, which in no wise hampers the output or alibis when the sags come, nor the optimistic outbursts, with more or less specious reasons given, on the rises.

West Palm Beach, in a burst of canny enthusiasm elected Major Bowes mayor of that city for a day.

THE CITRUS INDUSTRY

Other Florida communities have played their part in honoring the major, but it remained for Frostproof to offer Major Bowes the big job. On February 3 Major Edward T. Keanan of the Keenan Soil Laboratory wired Major Bowes as follows: "Pleased to offer you upon completion of Chase & Sanborn contract position of head of weather department of our organization. Salary no object provided results satisfactory." Right nice, from one major to another.

Then consider Bajor Bowes come-back at Major Keenan, in a letter acknowledging the telegram: "I have your telegraphed offer and have taken it under consideration. I believe I shall wait and see what the weather actually is this season without exercising my unique and extraordinary weather-producing gifts. You might find that the Florida weather is entirely satisfactory without necessity for the employment of a high salaried person. The least I should accept would be room and board and unlimited golf."

We missed the Orange Jubilee at Cocoa; we missed the Orange Festival at Winter Haven; we missed the Florida State Fair at Tampa; and we missed the Central Florida Fair at Orlando. Shucks, this year we aint been nowhere and we aint seen nothin'.

Naturally we felt complimented to have West Palm Beach take hold of our Ideal Mounutain blurb and by broadcasting their resolutions in its favor give the idea further stimulus and circulation. Originally that Ideal Mountain pearl appeared in these columns, though later reprinted in a number of places. We are not disconsolate because we were forgotten as the author, but we should have liked West Palm Beach to "mention THE CITRUS INDUSTRY in writing to advertisers." After all, S. L. Frisbie—he ought to have his head examined—pays us money for this babble; and for our part we like to see him encouraged.

By the way, we had our first meeting the other day with Frank L. Salisbury since he appeared in these columns as the hero of the Orlando shrimp-picking party, and he did not shoot. We begin to understand why Walter Winchell is still living. It's just too much trouble to clean out all the columnists.

Recently on a cold and drizzly night on the sidewalk of a strange

city we slouched along somewhat low in what passes with us for our mind. We had had a hard day. We were tired and our feet hurt. Suddenly a jovial bass voice boomed in our ear, "How would you like to have a glass of orange juice?" We whirled around, but it was only a delightful old gentleman addressing a delightful, and apparently quite deaf, old lady on his arm; and we were not in the picture. Still the suggestion was good, and after we had the orange juice we felt better about things.

HOW TO COMBAT ACIDITY IN THE SOIL

(Cointnued from page 6)

limestone they contain. Practically all the raw phosphates contain some calcium carbonate, which will act the same as limestone. We have found one sample that ran 13% calcium carbonate. While phosphate rock apparently has little effect in neutralizing soil acidity it will, we believe, prevent a further increase in acidity due to acid forming fertilizer residues.

Some fertilizer materials, notably basic slag, a by-product of the steel industry, and calcium cyanamid, a synthetic nitrogen compound, have very decided neutralizing power. On soils where the reaction is about what it should be, such materials should be used cautiously, while on soils too low in acidity or already on the alkaline side, they should be avoided. In no case should they be used around acid loving plants.

Other fertilizer materials such as nitrate of soda and nitrate of lime, and a few organic materials, have a slight acid neutralizing power. They can hardly be relied upon to bring about a change in the soil reaction, but they will in some cases prevent the soil from becoming more acid.

In closing, let me again caution you not to attempt to blindly change your soil reaction. Know what your soil is, and that a change toward the alkaline side will give you beneficial results before you add liming materials.

Okeechobee County citrus growers are now pruning their trees and cleaning up their groves in preparation for making a spring fertilizer application, reports County Agent C. A. Fulford.

Digestibility of meat protein is about 97 percent, says Dr. A. L. Shealy, of State Experiment Station.

SOME IDEAS OF SOIL DEFICIENCIES

(Continued from page 3)

fully explained. Also, over-liming may induce iron deficiency which in some instances may be corrected by the use of iron compounds on the soil or as a spray. There are other examples of the deleterious action of the application of fertilizers and soil amendments in causing deficiencies in the soil, but these serve to illustrate the

point.

Soil amendment is apparently an important point to be considered in the question of soil deficiencies. Soil management includes cultural practices, rotation of crops, cover cropping and such methods of tending the soil. That soil deficiencies may be caused by improper methods of soil management or corrected by proper methods has been shown by recent experiments, while the principals have been appreciated and utilized for

many years by practical farmers on many soils in Florida. Reference is made specifically to the practice of "land resting", or allowing cultivated land to grow up to volunteer weeds and grasses between cultivated crops. This type of rotation—for rotation it is, has been generally used for a number of years on the poorer types of soil in general field crops in the state. Maintaining these poorer soil types in annual culture leads to

(Continued on page 22)

BROGDEx

in the Market

MARKET BUYERS have noticed that despite the large amount of soft, tender fruit being received, Brogdex brands come in plump and firm, that they are less liable to pitting and that the fruit retains all of its natural goodness and attractiveness clear through to the consumer.

This soft, tender fruit is giving market buyers a lot of trouble — buyers are coming back for adjustments because of decay, pitting, discoloration and general breakdown.

This condition again emphasizes the value of Brogdex — the only control agent that can be depended upon to safeguard the fruit from the shipper to the consumer.

And while there are many imitations of Brogdex, market conditions today show as never before, that Brogdex is without a worthy rival — that none of the substitutes for it are either satisfactory or economical.

Brogdex costs only a few cents a box, so why fool with the imitation when there is so much at stake. Take advantage of the prestige and market preference shown Brogdex everywhere and you will have a much better balance sheet at the end of the season.

If not already a Brogdex house let us submit a proposal. A small cash payment will swing the deal and then you can pay by the box as you go.

Write, wire or phone — a representative will see you at once.

Florida Brogdex Distributors, Inc.

B. C. Skinner, Manager

DUNEDIN, FLORIDA

Spring Grove Fertilizing, and Irrigation

E. F. DeBUSK, CITRICULTURIST

What is known as the spring application of fertilizer undoubtedly plays a very important part in the production of a crop of citrus fruit. The results of the spring fertilizing will depend very largely upon the timeliness of the application, amount of available nitrogen used, and the available supply of moisture.

Research seems to support the general practice of making the spring application of fertilizer between the middle of January and the middle of February, depending upon location and seasonal conditions. The application is usually delayed somewhat in the northern part of the citrus belt, and elsewhere in years of late spring. Citrus trees shall probably send out growth and bloom relatively early this year. The fear of pushing out the new growth and bloom, and suffering injury from a probable late cold spell will cause some growers to hold back the application of fertilizer until later. This may be a wise procedure with young trees; but years of experience teach that when old bearing citrus trees begin to put forth new growth and bloom, early in February, the proper thing to do in making sure of a crop of fruit for that year is to have a liberal supply of available nitrogen well incorporated in the soil. When an early growth is killed by a late frost, the tree that has a good supply of nitrogen stored up, or available in the soil, will immediately put forth new growth and more bloom; whereas the underfertilized tree will be very slow in coming back. Withholding the spring application of fertilizer does not keep back growth.

I have already suggested the desirability of the use of quickly available forms of nitrogen in the spring application. This is because heavy demands are made upon the tree for nitrogen during the period of spring growth and blooming. For best results, apparently the whole root system should have access to an ample supply of available nitrogen. To make this possible the entire soil mass occupied by the root system of the tree should be charged with water-soluble nitrogen preceding the spring flush

of growth and blooming.

I have purposely stressed the importance of the element nitrogen in the spring fertilizing. It must be recognized that nitrogen is the limiting factor in citrus production. Research and practical experience of the past years bring out the fact that the phosphoric acid and potash may be left out of the spring application without affecting production, provided the tree requirements of these two elements is made up in the summer and fall applications. Trees with a spread of 16 to 20 feet should receive in the spring application $3\frac{1}{2}$ to 5 pounds of sulphate of ammonia. If a mixed fertilizer is used the application should carry an equivalent amount of nitrogen. If no cultivation is practiced these amounts should be increased about 20 per cent to provide for the cover-crop that may be grown.

Apparently there is very little or no advantage in working into the soil these soluble forms of plant feed. In applying the spring fertilizer to large bearing trees, 30 to 40 per cent should be distributed uniformly under the branches of the trees where the highest root concentration is found.

At the present time, the citrus groves throughout the state are fairly well supplied with moisture from the winter rains. Up to this time many have not been well supplied with nitrogen. However, where there is an adequate supply of soil moisture throughout the root zone there is still time to supply nitrogen for the bloom

and setting of fruit provided it is applied in a quickly available form, such as nitrate of soda or calcium nitrate. Only a light rain or light application of irrigation water is needed to distribute these quickly available forms of nitrogen throughout the root zone of the trees when the soil presents high moisture content.

Water is an extremely important factor in bringing out a citrus bloom and in setting the crop of young fruit. A low soil moisture condition seems to favor the formation or differentiation of the bloom but a relatively high soil moisture is needed to develop and bring out the bloom.

A study of the relation of rainfall and winter temperature to fruit production during the last ten years brings out the fact that a heavy vigorous bloom usually follows a definite dormant period of the trees at some time between the middle of December and the middle of February, followed by sufficient rainfall to wet the entire root zone just before blooming time. This dormant condition of the trees may be induced by either low soil moisture or low temperature or both. The most direct relationship brought out by the study referred to is the flush of bloom that invariably follows a short season of rainfall preceded by a period of low soil moisture. This correlation is noted not only during the normal blooming period but on into the summer. It is this condition that often results in a June bloom.

With the winter grove conditions favoring the differentiation of a

IRRIGATION AND SPRAY EQUIPMENT

Our Representative Will Be Glad To Estimate Your
Requirements

THE CAMERON AND BARKLEY CO.
MACHINERY & SUPPLIES
TAMPA, FLA.

heavy bloom as we have it at the present time, the next important step in producing a big crop of fruit is to see that the soil is kept wetted and the trees supplied with available plant nutrients throughout the entire root zone from now until the crop is made. We often have a heavy dropping of bloom resulting from a limited amount of water—enough water to bring out the bloom but not enough to hold it. This has resulted where the top few inches of the soil was wetted while it remained dry below. There is also much evidence that dropping of bloom and young fruit may result from a deficiency of available nitrogen, even though an adequate supply of soil moisture is maintained.

Right here I wish to stress the importance of an even application of irrigation water during the spring and early summer irrigation period, and an even application of fertilizer at all times. While it has been clearly demonstrated that there is a ready cross-transfer of water throughout the tree—that is the entire tree may receive water from only a part of the root zone—at the same time it is apparent that withholding water from a portion of the root zone results in a marked decrease in the total supply of water available to the tree. Furthermore, research has pointed out that nitrogen and other nutrients move in definite paths from main roots, to main branches. It would, therefore, seem desirable to supply nutrients to as nearly 100 percent of moisture and quickly available plant the root zone as practicable during the spring and early summer, during which time the transpiration rate is high and the need of available plant food is very great. I thank you.

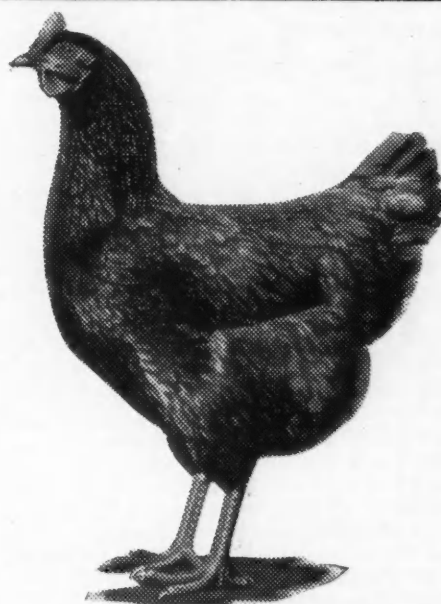
When traveling 60 miles an hour, an automobile moves 88 feet a second. It travels 50 feet before the driver can even push the brake pedal down.

Canning of grapefruit, food preparation, and home improvement are now being stressed by Pinellas County 4-H club girls, Mrs. Joy Belle Hess, home agent, reports.

E. L. LORD

Consulting Horticulturist.
Grove Advisory Service.
Economical, Safe, Effective.
Why not give your grove a break?

P. O. Box 757
Winter Haven, Fla.



QUEEN OF ALL THE HENS

AMONG THE MILLIONS of hens in America today, the blue ribbon for egg production goes to only one. She earns first prize with 324 eggs a year for two consecutive years—more than four times the national average of 70.

Suppose every hen did that. Think what profits that would mean to poultry men. But most hens are just hens, common, ordinary hens. There is only one champion. To just one single hen, Nature gives the vital spark—that perfect natural balance of all the elements that make a champion.

The champion hen is Mother Nature at her best—one of Nature's

rare masterpieces. Because she stands out from the flock, because she does things that other hens can't do, she is worth her weight in gold, while the rest of the flock is worth just about two bits a pound—dead or alive.

And here is another of Nature's masterpieces—Natural Chilean Soda. Like the champion hen, Chilean has Nature's priceless gift—that perfect natural balance of the major elements and the vital minor ones. The vital spark—the secret of every champion—is in Chilean—born there, and kept alive through centuries of aging and mellowing in the ground.

Natural
CHILEAN NITRATE

Natural Chilean contains almost two score of major and minor elements such as boron, magnesium, manganese, iodine, calcium, potassium, etc.—each a vital element in growth and development of plant

★ The Vital Impurities in Nature's Own Balance and Blend ★

SOME IDEAS OF SOIL DEFICIENCIES

(Continued from page 19)

the development of serious manifestations of malnutrition in some plants, such as white-bud of corn and decreased peanut yields. Pure zinc sulphate when applied to the soil prevents white bud of corn and in many instances increases peanut yields. Likewise, symptoms of malnutrition of velvet beans, cowpeas and pearl millet may be prevented by the application of zinc sulphate to the soil before planting. At the same time, allowing sandy lands to lie fallow to volunteer weeds and grass materially reduced white bud of corn over that observed on lands kept in continual culture to this plant or planted to high yielding leguminous cover crops. "Resting the land" as practiced for many years in Florida on sandy soils thus has some real scientific basis yet to be determined. But the practice of "resting the land" is not the only example of the value of volunteer cover crops. In South Carolina, tobacco growers recognize the value of "volunteer cover" in the production of tobacco of superior burning qualities.

This discussion of rotations raises the all important question of organic matter in the soil. It emphasizes the importance of a consideration of the order of crop succession. At the same time, experiments have emphasized the value of animal manures and other crude organic materials as a source of trace elements. The gradual change from the use of crude sources of fertilizing materials and from the use of animal manures has brought forcefully to attention the deficiencies of many trace elements, as indicated by practical experience and experimental evidence.

FLORIDA STUDENT WINS THIRD PRIZE IN ESSAY CONTEST FOR COLLEGES

Third grand prize in an essay contest for Southern agricultural colleges was won by Ben L. Gittings, of Brooksville, Fla., a senior in the University of Agriculture of Florida College of Agriculture, Major W. L. Floyd, assistant dean of the institution, announced recently.

Mr. Gittings won the first prize in the contest at the state institution and then his paper was submitted to judges for consideration in the contest for all Southern agricultural colleges. He was awarded third grand prize in the latter.

IF suffering with Piles, I want to help you. Drop me a line explaining.

Fred C. Whitney
317 6th Ave., Des Moines, Iowa

CLASSIFIED

Advertisements

The rate for advertisements of this nature is only five cents per word for each insertion. You may count the number of words you have, multiply it by five, and you will have the cost of the advertisement for one insertion. Multiply this by the total number of insertions desired and you will have the total cost. This rate is so low that we cannot charge classified accounts, and would, therefore, appreciate a remittance with order. No advertisement accepted for less than 50 cents.

2 YR. FIELD GROWN ROSE BUSHES: Red, Pink, Shell, Salmon, White Radiance, Hollande, Columbia, Briarcliff, Sunburst, Pres. Hoover, Victoria, Talisman, Sensation. All 19c each, postpaid. Ship C.O.D. NAUGHTON FARMS, Waxahachie, Texas.

CAUSERIENCE LEPIDOFLOIA — (So-called Brazilian oak), resembles Australian pine. Grand for wind-breaks. Cold resistant. Beautiful. Send for sample of foliage. \$6.00 per 100. S. F. Matthews, Homestead, Fla.

ALYCE CLOVER, the best legume for hay or covercrop. Write for information. Hardin Groves, Box 63, Lakeland, Fla.

FOR SALE — 80 acres good citrus land, two miles northwest of Cocoa, Brevard County, Florida. Price \$1600.00 cash. S. Hendry, City Point, Florida.

FILMS DEVELOPED 2 prints of each 25c; 20 reprints 25c. Pine Photo, Y-5134 Nevada, Chicago.

THRIFTY TREES and budwood from record performance Perrine Lemon parents, Persian Lime and other citrus varieties. DeSoto Nurseries, DeSoto City, Fla.

CROTALARIA — New crop, high quality, double cleaned, scarified Crotalaria Striata seed for sale. Attractive prices. Carolinas' Crotalaria Co., Camden, S. C.

UP to \$20.00 paid for Indian Head Cents; Half Cents \$125.00; Large Copper Cents \$500.00, etc. Send dime for list. Roman-coinshop, D. Springfield, Mass.

Large citrus trees for replanting at special low price. Grafted avocado trees and budwood of Perrine lemon and Tahiti limes. WARD'S NURSERY, Avon Park, Fla.

MEN WANTED—Sell Shirts. No experience necessary. Free samples. Commission in advance. Free ties with shirts. Carroll Mills, 875A Flatbush Av., Brooklyn N. Y.

HARDIN'S SPERRYOLA Lemon, a profitable adapted commercial variety for all sections. Hardy, prolific grower and producer. Limited number choice trees. Hardin Nurseries, Box 63, Lakeland, Fla.

WANTED — Man with from ten thousand to twenty thousand dollars to grow an entirely new orange for the U. S. markets. Cheap lands, no cold, plenty water, no fertilizer. A world beater in an orange. Patented.—Address, Buen Negocio, Gaveta -1, Holguin, Cuba.

PERSONAL

QUIT TOBACCO easily, inexpensively, without drugs. Send address. N. A. Stokes, Mohawk, Florida.

POSITION WANTED — Managing, caring for citrus grove, for good, reliable party. Highest type reference gladly furnished. H. A. KUTER, Elkton, Fla.

WANTED—To hear from owner of land for sale. O. Hawley, Baldwin, Wis.

FREE Booklet describes 87 plans for making \$20-\$100 weekly, home or office, business your own. Elite Service, 505 Fifth ave., New York City.

CLEOPATRA MANDARIN and Sour Orange rood stood. Also Hamlin, Valencia and Persian Lime budded trees. Grand Island Nurseries, Eustis, Fla.

WANTED—To hear from owner having good farm for sale. Cash price, particulars, John Black, Chippewa Falls, Wisconsin.

PUREBRED PULLETS FOR SALE—White Leghorns and Anconas ready to ship. Barred Rocks and R. I. Reds shortly. Several hundred yearling White Leghorn hens now laying 70%. Write or wire for prices. C. A. Norman, Dr. 1440, Knoxville, Tenn.

LAREDO SOY BEANS, considered free from nematode, excellent for hay and soil improvement. Write the Baldwin County Seed Growers Association, Loxley, Alabama, for prices.

FANCY ABAKKA pineapple plants. R. A. Saeger, Ankona, Florida.

FOR SALE—Selected budwood and trees of Perrine lemon, Tahiti lime, new varieties tangelos and other citrus. Ward's Nursery, Avon Park, Fla.

SCENIC HIGHWAY NURSERIES has a large stock of early and late grapefruit and oranges. One, two and three year buds. This nursery has been operated since 1883 by G. H. Gibbons, Waverly, Fla.

NEW COMMERCIAL lemon for Florida, the Perrine; proven. All residents need yard trees, keeping Florida money at home. Booking orders for budded stock for Winter delivery. DeSoto Nurseries, DeSoto City, Fla.

SATSUMA BUDWOOD from Bearing Trees. Hills Fruit Farm, Panama City, Fla.

SEED—Rough lemon, sour orange, cleopatra. New crop from type true parent trees. Also thrifty seedlings. DeSoto Nurseries, DeSoto City, Florida.

BUDDED trees new Florida commercial lemon, proven, thin skinned, juicy, scab immune. Also rough lemon, sour orange and Cleopatra seed and liningout seedlings. DeSoto Nurseries, DeSoto City, Fla.

SEEDS—ROUGH LEMON, SOUR ORANGE, CLEOPATRA. Pure, fresh, good germination. Also seedlings lineout size. DeSoto Nurseries, DeSoto City, Fla.

CROTALARIA SPECTABILIS—Seed for sale. New crop, well cured, bright and clean. Price 25c per pound in 100 pound lots and over, 80c per pound in less quantities. F. O. B. Hastings, Bunnell, Lowell and San Antonio, Florida. F. M. LEONARD & COMPANY, Hastings, Florida.

WANTED—Position as packing house foreman; in citrus business twenty-five years; ten years' experience as foreman; married man. J. R. Henry, Okahumpka, Florida.

County Agents

The Work Of Florida County Agents -- 1935

By W. L. NETTLES, District Agent

We are attempting here to give you a resume of what County Agents in Florida have been doing this year. We can only give you a few of the highlights as the County Agent plays the part of friend, counsellor, guide and leader to the farmer in assisting him in solving his many complex problems.

The County Agent's office is always headquarters for farmers applying for government loans through the P. C. A., emergency seed loans and other forms of financing the government is fostering. Advice, information and guidance is always given these farmers applying for these loans.

The County Agent's office is also headquarters for the U. S. Bureau of Entomology in its campaign on screw worm control. The agents in this work and the farmers look to the County Agent for advice and guidance. There is also a well trodden path from the Resettlement office in each county to the office of the County Agent, where advice, counsel and cooperation is sought and received.

Now, up to the present we have been talking about some of the incidentals connected with the work of the County Agent. His big work, the work for which the Agricultural Extension Service was first created, is to deal directly with farmers in a program of more efficient and economical methods of production and

marketing. Bringing to the farmer the results of the best information available.

The foundation of the County Agents' methods is what is known in Agricultural Extension circles as the DEMONSTRATION. A demonstration is simply selling the farmer on an idea to the extent that he is willing to actually try the thing out to his own satisfaction. The three steps a County Agent takes in getting his program across are: first, talk to the farmer about it; if this fails to convince him, he takes him to where some one else is doing the thing he is trying to put over; then, if this fail, he persuades the farmer just to try the idea out by doing it himself—from small beginnings like this changes of practice for more efficient agriculture are started in communities and afterwards become an established method of farming. To give an example which could be multiplied by thousands, three years ago a County Agent attempted to get a few dairymen in his county to put up some silage in a trench silo—a trench silo is constructed by just digging a long hole in the ground, putting the silage in and covering it with straw and dirt like you would a potato bank. The reason for this was the economy in saving feed. The first year this County Agent persuaded three dairymen to try the thing out. When they started to feed this silage, the Agent got up what we call in Extension circles, a farm tour. That is, he got a dozen or more dairymen to visit these farms on a designated day and time and had the dairymen who tried

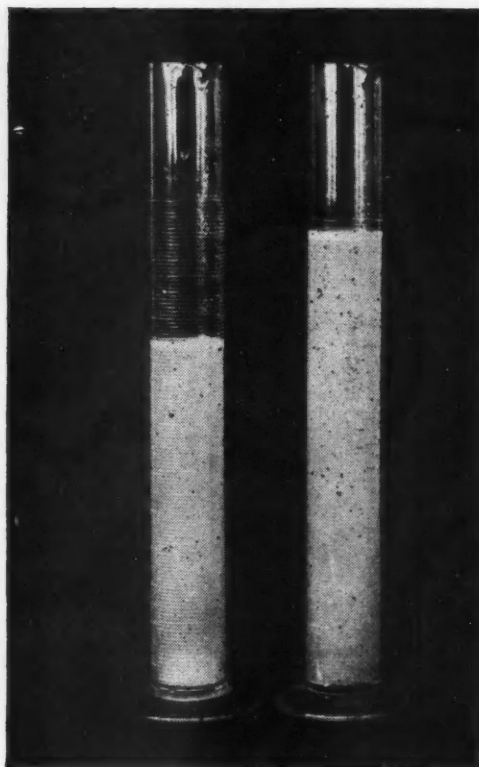
out the silo to tell those visiting dairymen what they thought of the idea. The result of this move was the next year 15 dairymen put in trench silos and this year more than 90 per cent of the dairymen are saving silage for feed and there are around 100 dairymen in the county. As I stated, a moment ago, this example can be multiplied by thousands over the state.

The County Agent has two sources from which he draws for information in carrying this program of better agriculture to the farmers: first, the results of research work, the facts that have been found out in our Experiment Stations through years of research, and second, the tried and approved methods of other practical and progressive farmers.

The farmer himself is not the only one on the farm that the County Agent attempts to work through—but if there is a live, wide-awake boy on that farm between the ages of 10 and 20, he is invited to line up in our famous 4-H club—a national organization of rural boys who, working with the County Agent, work out demonstrations in the most approved methods in agriculture. There are around 35,000 of these 4-H club boys in the state this year, carrying around 6 thousand separate pieces of work for the betterment of the agricultural conditions on their fathers' farms and in their communities. These boys grow gardens and truck crops, field crops, livestock, poultry and forestry, study farm management and in addition work out plans for community social activities and a finer rural life.

QUALITY

.. builds markets



The fruit that has that *extra quality* is the fruit that creates and holds consumer demand. • Note the extra quality in the fruit at right in the photograph. It has better color, better shape, finer finish, a thinner, tougher rind and more juice of finer flavor. • Note the extra juice in this fruit as shown by the juice extractions pictured above.

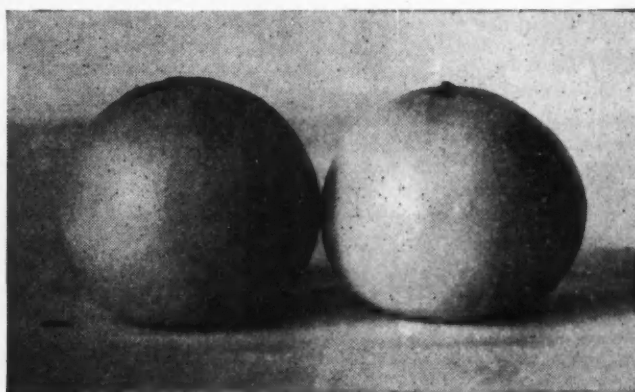
• Citrus fruits remove from the soil more potash than both nitrogen and phosphoric acid combined. • Nitrogen produces volume, phosphoric acid maturity, but potash adds the quality that gets the best prices. All three are demanded in a well-balanced fertilizer to keep up the producing power of your grove. • Potash is the quality-producing element in your fertilizer. It develops smooth tissues, fine grain, heavy sugar content and causes your fruit to put on excellent finish.

THE quality of your citrus fruit largely depends on the fertilizer you use. **NV Sulphate of Potash** is the quality-producing element in citrus fertilizer. It will pay you to make sure that your fertilizer contains sufficient quantities of this element to produce smooth, well-shaped fruit with fine finish, high color, excellent texture and a large volume of juice with the proper content of solids.

Your trees must stay on the job throughout the year to produce top-price fruit. Your spring, summer and fall applications of fertilizer should all contain ample quantities of **NV Sulphate of Potash** so that your trees have plenty of the quality-producing element available for their use at all times.

Omitting or reducing the potash in any of these applications slows down the manufacture and transfer of carbohydrates (*the sugars, starches and solids of the juice*) and reduces the dessert quality as well as the appearance of the fruit. Unbalanced fertilizer containing insufficient potash stimulates trees into the production of coarse, poor quality, low-priced fruit.

You will never know what fine fruit your grove can produce until you keep it well supplied with fertilizer well-balanced with **NV Sulphate of Potash**. Try it this season and watch results. Your trees will thank you with extra yields and extra quality.



SULPHATE of POTASH

is the Quality Builder in Fertilizer

N. V. POTASH EXPORT MY., Inc., Hurt Bldg., Atlanta • **J. L. Baskin,** Representative, Box 1051, Orlando